REMARKS

Based on the above amendments and remarks to follow, reconsideration of this application is respectfully requested.

In this office action, claims 6-13 were rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter. Claims 1-2, 6-9, 13, 14-17 and 21 were rejected under 35 U.S.C. 102 (b) as being anticipated by Lee et al. (US Patent No. 6,539,060). Claims 3-5, 10-12 and 18-20 were rejected under 35 U.S.C. 103 (a) as being unpatentable over Lee et al. in view of Kim et al. (US Patent No. 6,950,473).

In response to the rejections, claims 6-13 have been cancelled without prejudice or disclaimer.

The Present Invention

The present invention relates to a system and computer program product for adaptive post-processing of media data in an electronic device.

The media data is encoded using standard encoding techniques such as JPEG or MPEG in order to achieve compression. The media data is decoded at the electronic device when the image is displayed to a user. The decoded media data contains visible artifacts as a result of quantization and lossy compression. To eliminate visible artifacts, a set of post-processing steps are implemented in the electronic device.

The system disclosed in the present invention comprises a set of post-processing modules. Further, the system discloses an adaptive mode decision module to control the post-processing modules. The post-processing modules include a deblocking module, a deringing module, a color space conversion module, an image-resizing module, and a bit reduction and dithering module. Each post-processing module processes the media data using one or more methods referred to as processing modes.

The adaptive mode decision module includes an input module, a table module, and an output module. The input module provides the adaptive mode decision module with a set of input parameters. The input parameters are representative of the state of the electronic device, such as remaining battery power of the electronic device, processor usage of the processor in the electronic device and user preference. The table module defines suitable processing modes of the post-processing modules corresponding to all the possible values of the input parameters. The output module uses the input parameters and the table module to decide upon the suitable processing modes to be implemented from each post-processing module. This is a continuous monitoring process, that is, the current values of the input parameters are continuously obtained and sent to the output module. Subsequently, a decision on the choice of complexity level is made and the output module generates control signals that are sent to the post-processing modules. These control signals choose the processing mode in each post-processing module. Finally, the post-processing modules perform the post-processing of the media data according to the selected processing modes.

<u>The Cited Art</u>

With reference to the citied art in the office action, Lee et al. (US 6,539,060) discloses an image data post-processing method and an apparatus for reducing quantization effect when image data is decoded. Lee et al. discloses an apparatus comprises a semaphore extractor, a deblocking filter, a corner outlier compensator and a deringing filter. The semaphore extractor extracts a semaphore from a decoded image. The semaphore represents whether the image data requires post-processing. The semaphore is divided into a blocking semaphore and a ringing semaphore.

The deblocking filter checks the blocking semaphore extracted from the semaphore extractor and performs deblocking filtering on the decoded image data. The outlier compensator detects a corner outlier of the data passed through the deblocking filter and compensates for the detected corner outlier. The deringing filter checks the ringing semaphore and performs deringing filtering on the corner outlier

compensated data. The output image obtained after deringing filtering has reduced quantization effects.

<u>Differences between the present invention and the cited art</u>
In the office action, the independent claim 1 is rejected under 35 U.S.C 102(b) as being anticipated by Lee et al. (US Patent No. 6, 539,060).

Independent claim 1 of the present invention recites a system for post-processing of media data. The post-processing is performed by various modes of the post-processing modules with different complexities. The support for this recitation is found at pp-3, lines 27-29, pp-6, lines 30-32, pp-7, lines 1-12, pp-8, lines 6-8. Depending upon the input parameters, the adaptive mode decision module selects a suitable mode for post-processing of the media data. The input parameters are representative of the state of the electronic device, such as remaining battery power of the electronic device, processor usage of the processor in the electronic device and user preference. The support for this recitation is found at pp3, line 32, pp4, line 1 and pp 7, lines 25-27.

Lee et al. (col 5, lines 37-55, col 7, lines 64-67 & col 8, lines 1-2) discloses an image data post-processing apparatus comprising one or more post-processing modules. *However, Lee et al. does not disclose various modes of each post processing module with different complexities.* Further, Lee et al. discloses a semaphore detector for detecting a semaphore representing whether or not post processing is required. The semaphore is divided into a blocking semaphore and a ringing semaphore. The semaphore is detected using distribution of inverse quantization coefficients of the decoded image. In order to perform deblocking or defiltering, the corresponding semaphore is set to '1'. *However, Lee et al. does not disclose any module that decides suitable processing modes.* Furthermore, unlike the present invention, in Lee et al., the input parameter required for post-processing of data is a semaphore that is extracted from the decoded image. Whereas in the present invention, the input parameters are representative of the state of the electronic device.

Therefore, in light of the above discussion, it is respectfully highlighted that the independent claim 1 has elements neither anticipated, nor rendered obvious by the publication to Lee et al. Therefore, we request you to reconsider the independent claim 1.

In the office action, the dependent claim 2 is rejected under 35 U.S.C 102(b) as being anticipated by Lee et al.

Clause (a) of claim 2 of the present invention recites an input module for receiving the input parameters that are representative of the status of the electronic device. Examples of input parameters include remaining battery power of the electronic device, processor usage of the processor in the electronic device and user preference. The support for this recitation is found in pp3, line 32, pp4, line 1 and pp 7, lines 25-27. *However, unlike the present invention, in Lee et al., the input parameter required for post-processing of data is a semaphore that is extracted from the decoded image.* The semaphore, as described in Lee et al. represents whether or not the decoded image requires post-processing.

Clause (b) of claim 2 of the present invention recites a table module that relates the processing modes of the post-processing modules to all possible values of the input parameters. However, as cited in the office action, Lee et al. discloses a table for deringing filtering (col 11, lines 60-67 and col 12, lines 1-15). The deranging filtering is performed to smooth the ringing noise without the loss of image details. The table shown in col 11, lines 60-67 and col 12, lines 1-15 shows signal adaptive filtering performed on a decoded image. *Therefore, unlike the present invention, the table disclosed in Lee et al. does not relate to selection of an adaptive mode for post-processing of the media data.*

Clause (c) of claim 2 of the present invention recites an output module coupled to the input module and the table module. The output module selects suitable processing modes of the post-processing modules. Lee et al. discloses an apparatus (col 6, lines 14-17) for reducing quantization effect when an image is decoded by the

decoder. *However, Lee et al. does not disclose an output module for selecting the suitable processing modes of the post-processing modules.*

Therefore, in light of the above discussion, it is respectfully highlighted that the dependent claim 2 has elements neither anticipated, nor rendered obvious by the publication to Lee et al. Therefore, we request you to reconsider the dependent claim 2.

In the office action, claims 3-5 are rejected under 35 U.S.C 103(a) as being unpatentable over Lee et al. in view of Kim et al. (US Patent No. 6,950,473).

Kim et al. discloses a method of reducing artifacts in digital data by obtaining the input parameters comprising remaining battery power in the electronic device (col 4, lines 48-65), processor usage of the electronic device (col 11, lines 65-67 & col 12, lines 1-8, lines 63-67 & col 13, lines 1-7) and the user preference indicating desired output quality of the media data (col 9, lines 41-44). However, Lee et al. does not disclose performing post-processing of the media data using various modes of each post processing module with different complexities. Use of these parameters in conjunction with Lee et al. makes the present invention neither anticipated nor rendered obvious. Moreover, the dependent claims 3-5 have elements, which when read in conjunction with independent claim 1, make the present invention different from the Lee et al., and should be made allowable. Therefore, reconsideration of dependent claims 3-5 is respectfully submitted.

In the office action, claims 6-13 are rejected under 35 U.S.C 101 because the claimed invention is directed to non-statutory subject matter. Claims 6-13 have been cancelled without prejudice or disclaimer.

In the office action, claims 14 -17 and 21 are rejected under 35 U.S.C 102(b) as being anticipated by Lee et al.

Independent claim 14 of the present invention recites a computer program product for obtaining the input parameters for the post-processing of the media data. As

discussed above in the explanation for claim 1, the input parameters in the present invention are representative of the status of the electronic device. However, unlike the present invention, Lee et al. discloses a semaphore that is extracted from the decoded image. Further, unlike the present invention, in Lee et al., the input parameter required for post-processing of data is a semaphore that is extracted from the decoded image. Moreover, unlike the present invention, Lee et al. does not disclose performing post-processing of the media data using various modes of each post processing module with different complexities.

Therefore, in the light of the above discussion, it is respectfully highlighted that the independent claim 14 has elements neither anticipated, nor rendered obvious by the publication to Lee et al. Therefore, we request you to reconsider the independent claim 14. Moreover, it is respectfully submitted that the dependent claims 15-17 and 21 have elements, which when read in conjunction with independent claim 14, make the present invention different from the Lee et al., and should be allowable. Therefore, reconsideration of dependent claims 15-17 and 21 is respectfully submitted.

In the office action, dependent claims 18-20 are rejected under 35 U.S.C 103(a) as being unpatentable over Lee et al. in view of Kim et al.

Kim et al. discloses a method of reducing artifacts in digital data by obtaining the input parameters comprising remaining battery power in the electronic device (col 4, lines 48-65), processor usage of the electronic device (col 11, lines 65-67 & col 12, lines 1-8, lines 63-67 & col 13, lines 1-7) and the user preference indicating desired output quality of the media data (col 9, lines 41-44). However, Lee et al. does not disclose performing post-processing of the media data using various modes of each post processing module with different complexities. Use of these parameters in conjunction with Lee et al. makes the present invention neither anticipated nor rendered obvious. Moreover, the dependent claims 18-20 have elements, which when read in conjunction with independent claim 14, make the present invention different from the Lee et al., and should be made allowable. Therefore, reconsideration of dependent claims 18-20 is respectfully submitted.

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CONCLUSION:

The present claims have been amended and justifications have been provided to highlight the distinctions of the present invention over the cited art and it is respectfully submitted that the claims are now clearly patentable over the art of record, and notice to that effect is earnestly solicited. If the Examiner has any questions regarding this matter, the Examiner is requested to telephone applicants' attorney at the numbers listed below prior to issuing a further action.

Authorization is hereby given to charge any fees necessitated by actions taken herein to Deposit Account 50-2117.

Respectfully submitted,
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